

WHAT IS CLAIMED IS:

1. A method of lyophilizing material, comprising the steps of:
 - 1 placing material to be processed in a chamber under temperature and pressure
 - 5 conditions facilitating lyophilization;
 - creating a microwave field in the chamber;
 - taking temperature measurements in the chamber;
 - controlling microwave power and duration to vary microwave field strength in response to temperature measurements;
- 10 trapping water vapor extracted from the material being dried.
2. A method according to claim 1, wherein the step of trapping water vapor comprises passing the water vapor through a condenser.
- 15 3. A method according to claim 1, wherein the step of trapping water vapor comprises passing the water vapor to or through a desiccant.
4. A method according to claim 1, comprising the further step of stirring the microwaves in the field to facilitate improved microwave dispersion in the chamber.
- 20 5. A method according to claim 1, comprising the further step of shielding selected surfaces in the chamber from direct exposure to microwaves.

6. A method of lyophilizing, comprising the steps of:
 placing material in a lyophilizing chamber, the chamber having a controllable
 temperature and pressure;
 creating chamber conditions to facilitate sublimation;
5 wherein in a first operating mode, the chamber utilizes temperature and pressure
 to facilitate sublimation, in a second mode, the chamber utilizes temperature, pressure
 and microwaves to facilitate sublimation, and in a third mode utilizes only microwaves to
 facilitate sublimation.

10 7. A method according to claim 6, wherein processing includes operation in a
 combination of two or more of the first, second and third modes.